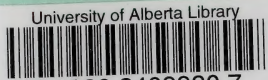


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Student and teacher: Use this cover sheet for mailing or faxing.

ASSIGNMENT BOOKLET

MAT1038 Applied Mathematics 10
Module 3

FOR STUDENT USE ONLY

FOR OFFICE USE ONLY

Date Assignment Submitted:

(If label is missing or incorrect)

Assigned

Teacher: _____

Time Spent on Assignment:

Student File Number:

Assignment

Grading: _____

Module Number: _____

Graded by: _____

Date Assignment Received:

Student's Questions and Comments

Apply Module Label Here

Name

Address

Postal Code

Please verify that preprinted label is for
correct course and module.

Teacher's Comments

Teacher

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When you are registered for distance learning courses, you are expected to regularly submit completed assignments for correction. Try to submit each section of assignments as soon as you complete it. Do not submit more than one Assignment Booklet in one subject at the same time. Before submitting your section assignments or your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

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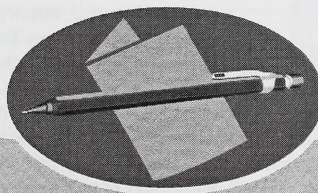
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Applied Mathematics 10

Module 3

Relations and Functions

ASSIGNMENT BOOKLET



Learning
Technologies
Branch

Alberta
LEARNING

FOR TEACHER'S USE ONLY

Summary

Total Possible Marks	Your Mark
60	

Teacher's Comments

Applied Mathematics 10
Module 3: Relations and Functions
Assignment Booklet
Learning Technologies Branch
ISBN 0-7741-1723-0

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	



You may find the following Internet sites useful:

- Alberta Learning, <http://www.learning.gov.ab.ca>
- Learning Technologies Branch, <http://www.learning.gov.ab.ca/lrb>
- Learning Resources Centre, <http://www.lrc.learning.gov.ab.ca>

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ASSIGNMENT BOOKLET

APPLIED MATHEMATICS 10 – MODULE 3: RELATIONS AND FUNCTIONS

Your mark on this module will be determined by how well you do on the assignment in this booklet and the module project in the Project Booklet.

The value of each part of the module assignment is stated in the left margin of this booklet. The total value of the module assignment is 60 marks.

60

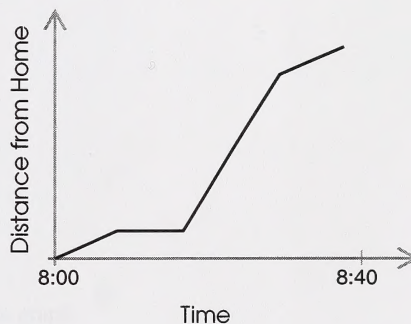
Module Assignment

Read all parts of this booklet carefully and record your answers in the appropriate places. Work slowly and carefully. If you are having difficulties, go back and review the appropriate activity in the Student Module Booklet.

Be sure to complete all parts of the assignment and proofread your responses before you submit this assignment to your teacher for grading.

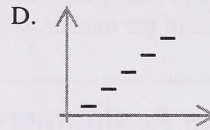
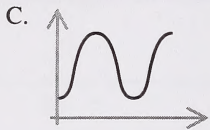
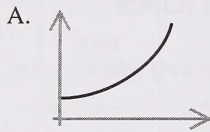
2

1. Rhonda's trips to school involve some walking and a ride on a bus. One trip was represented by the graph to the right. Write a scenario for this graph.



②

2. Which graph best represents the relation between height (above the ground) and time for a person riding a Ferris wheel? Circle the appropriate letter.



②

3. a. Make a sketch that shows the relationship between the height (above the ground) and the time for a child who is swinging on a swing in a playground. **Note:** Include at least 2 cycles of the swing.

②

- b. Describe the significance of any key points or changes in the graph.

4. A microwave oven has a magnetron tube that emits microwaves into the heating chamber. The microwaves generated by the magnetron are absorbed directly by the water and fat molecules of a substance in the chamber, making the molecules move faster. This heats the substance. When the oven is on a low setting, such as defrost, the magnetron goes on and off every few seconds, rather than staying on continuously. Only on the highest setting does the magnetron tube stay on continuously.

Suppose you placed a container of water into a microwave oven and that you used a low setting to bring the water to a boil.

②

- a. What would the heating curve of the water look like? Answer this by providing a sketch of the curve.

②

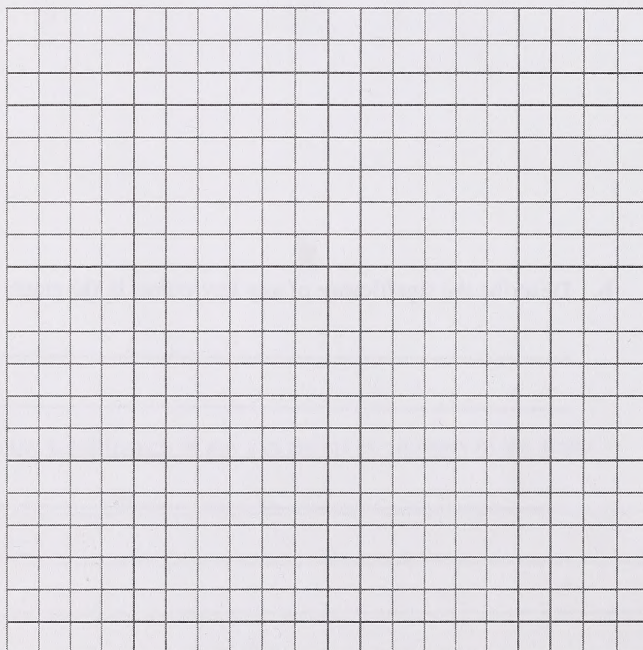
- b. Describe the significance of any key points in the graph.

5. Rashiq was studying the population growth of Alberta. He found the data shown in the table.

Year	Population (in thousands)
1941	800
1961	1330
1973	1770
1984	2370
1991	2550
1994	2720

②

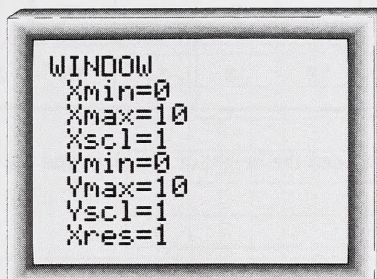
- a. Using a paper-and-pencil method, make a graph of the data in order to represent the population trend visually. Show the scale for both the horizontal and the vertical axes.



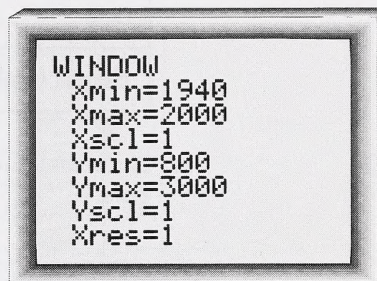
2

- b. Which of the following **WINDOW** settings would be best to graph the data on a graphing calculator? Circle the appropriate letter.

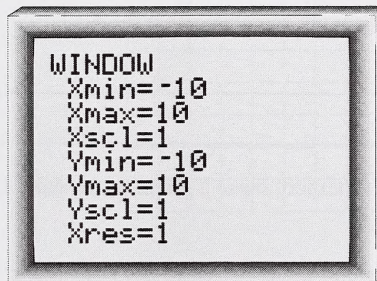
A.



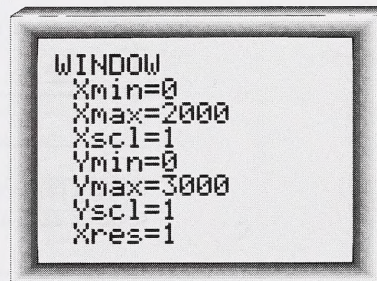
B.



C.



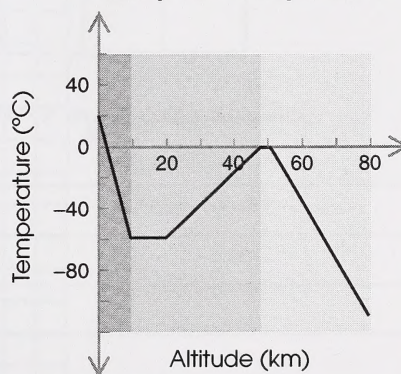
D.



6. The graph shows the temperature of the atmosphere according to the height above Earth's surface. For example, at the cruising height of a passenger jetliner—a height of approximately 9 km—the temperature is about -40°C .

2

- a. The graph is a visual representation of the relation between temperature and altitude. In order for this relation to be viewed as a function, which variable must be considered independent? Which variable must be considered dependent? Explain.

Atmospheric Temperature

2

- b. At what altitude, within the first 50 km of Earth's surface, is the atmosphere the coldest?

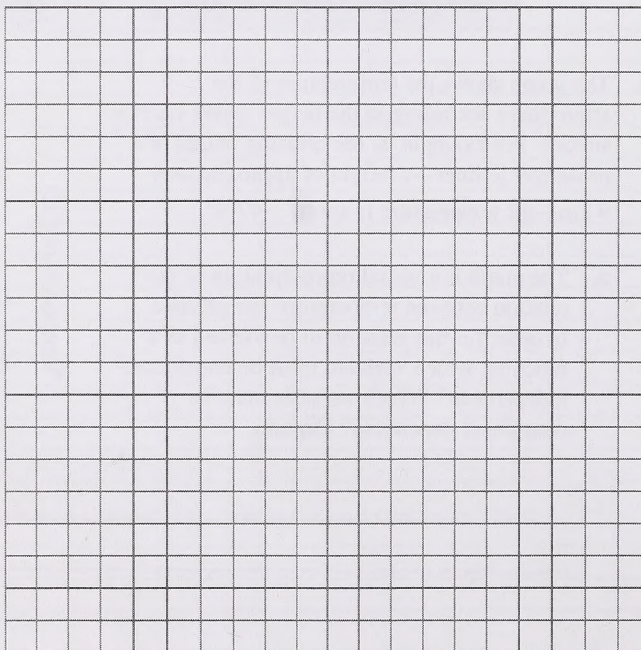
7. Michael recorded the growth of a tropical house plant over a number of days. He recorded this data.

Day	1	2	3	4	5	10	15
Height (cm)	10	12	13	14	15	25	39

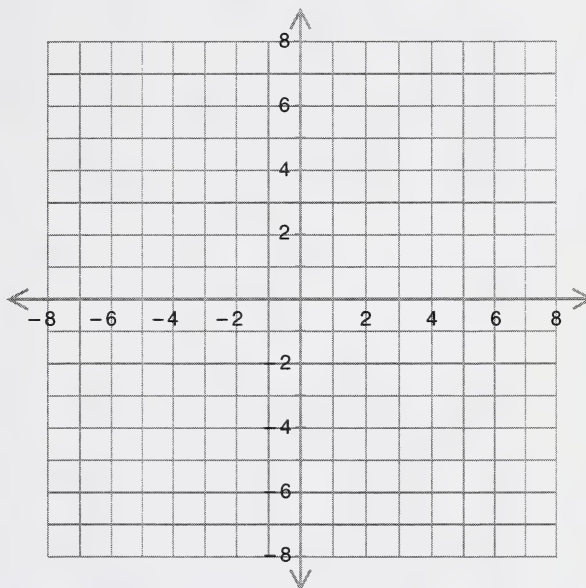
- ② a. Represent the relation between the height of the plant and the day in terms of ordered pairs.

- ② b. Will the graph continue in this pattern forever? Explain.

- ② c. Using a paper-and-pencil method, make a graph of the data. Label the axes and show a scale on each axis.



- ④ 8. a. Use paper and pencil to draw the graph of $y = 3x - 2$ on the grid. Identify at least two points on the graph by their coordinate pairs.



x							
y							

- ② b. Explain how you would graph the equation $y = 3x - 2$ on a graphing calculator.

2

9. Which of the following tables represents a relation that is **not** a function? Circle the appropriate letter.

A.

Input Value	Output Value
9	-18
4	8
16	32
32	64

B.

Input Value	Output Value
0	0
1 and -1	1
2 and -2	4
3	9

C.

Input Value	Output Value
-2	4
-1	2
0	0
1	-2

D.

Input Value	Output Value
10	0
4	2 and -2
9	3 and -3
16	4 and -4

10. On a winter camping trip, the temperature inside the tent, t (in degrees Celsius), was related to the temperature outside the tent, w (in degrees Celsius). The following function describes the relationship:

$$t = 1.5w + 20$$

6

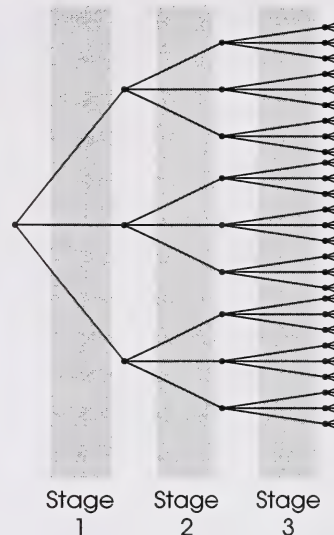
- a. What was the temperature inside the tent when the temperature outside the tent was 0°C ? -5°C ? -10°C ? **Note:** You can use the TRACE feature or TABLE feature of your graphing calculator to solve this problem or you can use substitution.

2

- b. Write the function using function notation.
-

11. A forest fire was reported to be approaching a community. At a community meeting, a phone relay was organized to spread news quickly in case an evacuation was needed.

On being telephoned about an evacuation, one resident was to call three designated residents. These in turn were to call three others, and so on. (This relay system is illustrated in the diagram to the right.)

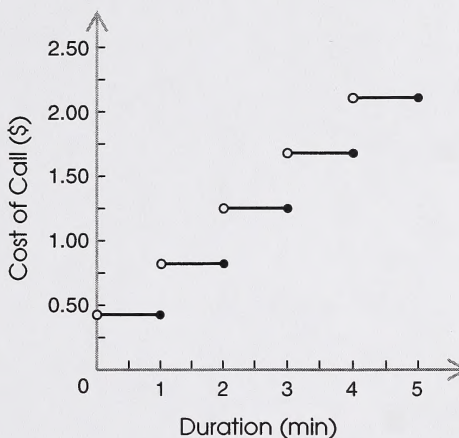


- a. Complete the following table to show the number of phone calls for the different stages of the relay.

Stage	Number of Phone Calls
1	3
2	9
3	
4	
5	

- b. Write an equation, in terms of x and y , for the function depicted by the table.
-

12. Company A bills for a cellular phone call according to its duration in minutes, as indicated by the graph.



②

- a. Express the relation in words.

②

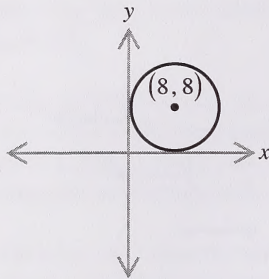
- b. Due to the power source of the cell phone, the maximum duration of any phone call is 75 minutes.

What is the domain of the relation?

②

- c. Is this relation a function? Explain.

13. Use the diagram to answer the question. The diagram shows the sketch for a relation.



- a. What is the domain of the relation? Circle the best answer.

②

- A. $0 \leq x \leq 8$
 B. $0 < x < 8$
 C. $0 \leq x \leq 16$
 D. $0 < x < 16$

②

- b. Is the relation a function? Why or why not?

14. A relation is represented by the data in the table.

Input value	-2	-1	0	2	3
Output value	-5	-2	1	7	10

②

- a. Is the relation a function? Explain.

②

- b. Express the relation as an equation in the form of $y =$.
